

Application No. 09/575,552

Docket No. 22-0099

Amendments to the Claims

1 (Original): A method for scheduling, in real-time, an order in which data packets from a plurality of uplink channels stored in priority-class queues are organized in a downlink channel of a satellite communications network, the method comprising:

conveying data packets over a downlink channel in an order determined by a packet service schedule;

monitoring at least one traffic parameter associated with at least one data stream stored in a priority-class queue, the traffic parameter being representative of an actual bandwidth usage of the corresponding priority-class queue; and

while conveying data packets over the downlink channel, modifying the packet service schedule based on said at least one traffic parameter.

2 (Original): The method of claim 1, further comprising:

monitoring an actual bandwidth used by each priority-class queue.

3 (Original): The method of claim 1, further comprising:

temporarily storing data packets in corresponding priority-class queues based on service requirements associated with a priority-class.

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4 (Original): The method of claim 1, further comprising:

measuring a phase of each data stream stored in a priority-class queue, said phase being indicative of an amount of time lapsed since a data packet from a particular priority-class queue was output to the downlink channel.

5 (Original): The method of claim 1, further comprising:

continuously obtaining new traffic parameters for each data stream by monitoring the arrival of data packets at the corresponding priority-class queue.

6 (Original): The method of claim 1, further comprising:

switching data packets from each uplink channel to a unique priority-class queue where said data packets are temporarily stored before being selected by the scheduler for output to the downlink.

7 (Original): The method of claim 1, further comprising:

storing the packet service schedule in a look-up table.

8 (Original): The method of claim 1, further comprising:

performing said conveying, monitoring and modifying steps on board a satellite.

9 (Original): The method of claim 1, further comprising:

calculating a new packet service schedule based on the traffic parameters according to a Packet Fair Queuing (PFQ) algorithm.

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10 (Original): The method of claim 1, further comprising:

allocating in the packet service schedule a dynamic amount of bandwidth to each priority-class queue.

11 (Original): The method of claim 1, further comprising:

adjusting the bandwidth allocated to at least one priority-class queue, while the priority-class queue is storing data packets.

12 (Original): The method of claim 1, further comprising:

modifying the packet service schedule by adjusting an amount of bandwidth allocated to at least one priority-class queue while the priority-class queue is storing data packets.

13 (Original): A communications satellite, comprising:

at least one uplink and downlink for conveying data packets over communications channels;

queues for collecting data packets from uplinks and outputting the data packets to a downlink using a dynamic amount of bandwidth; and

a scheduler for allocating bandwidth to at least one queue; said scheduler changing an amount of bandwidth allocated to at least one queue while said queue is buffering data packets between an uplink and downlink.

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14 (Original): The communications satellite of claim 13, further comprising:

a bandwidth measurement module for measuring a statistical bandwidth actually being used by at least one queue, said scheduler updating the bandwidth allocation of said at least one queue based on said measured statistical bandwidth.

15 (Original): The communications satellite of claim 13, further comprising:

a look-up table storing a master frame allocating bandwidth to at least one queue, said master frame comprising a plurality of time slots, each time slot including a priority queue index identifying a queue to output a data packet during the associated time slot.

16 (Original): The communications satellite of claim 13, further comprising:

means for measuring data packet rate for each queue, said scheduler modifying bandwidth allocation based on the measured data packet rate.

17 (Original): The communications satellite of claim 13, wherein said scheduler further comprises:

a processor calculating statistical bandwidth allocation to said queues based on actual traffic arriving at said queues.

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18 (Original): The communications satellite of claim 13, wherein said scheduler further comprises:

memory storing a packet service schedule identifying an order in which data packets pass over the downlink, said packet service schedule being based on bandwidth allocation calculated by said scheduler.

19 (Original): The communications satellite of claim 13, further comprising:

means for monitoring at least one traffic parameter associated with each downlink stream, said traffic parameter being representative of an actual usage of a priority-class associated with a queue, the scheduler changing bandwidth allocation based on said traffic parameter.

20 (Original): The communications satellite of claim 13, further comprising:

a switch for switching data packets from each uplink channel to a unique queue based on priority-classes of the data packets.

21 (Original): The communications satellite of claim 13, further comprising:

a processor calculating a new bandwidth allocation based on a Packet Fair Queuing algorithm.